

CLAIMS

What is claimed is:

1. A method of producing an antibody to a polypeptide comprising:
inoculating an animal with a polypeptide selected from the group consisting of:
 - a) a polypeptide consisting of amino acid residues 42 (Ile) to 102 (Asp) of SEQ ID NO:8;
 - b) a polypeptide consisting of amino acid residues 42 (Ile) to 60 (Ile) of SEQ ID NO:8;
 - c) a polypeptide consisting of amino acid residues 42 (Ile) to 69 (Glu) of SEQ ID NO:8;
 - d) a polypeptide consisting of amino acid residues 42 (Ile) to 81 (Cys) of SEQ ID NO:8;
 - e) a polypeptide consisting of amino acid residues 42 (Ile) to 96 (Lys) of SEQ ID NO:8;
 - f) a polypeptide consisting of amino acid residues 42 (Ile) to 102 (Asp) of SEQ ID NO:8;
 - g) a polypeptide consisting of amino acid residues 60 (Ile) to 69 (Glu) of SEQ ID NO:8;
 - h) a polypeptide consisting of amino acid residues 60 (Ile) to 81 (Cys) of SEQ ID NO:8;
 - i) a polypeptide consisting of amino acid residues 60 (Ile) to 96 (Lys) of SEQ ID NO:8;
 - j) a polypeptide consisting of amino acid residues 60 (Ile) to 102 (Asp) of SEQ ID NO:8;
 - k) a polypeptide consisting of amino acid residues 69 (Glu) to 81 (Cys) of SEQ ID NO:8;
 - l) a polypeptide consisting of amino acid residues 69 (Glu) to 96 (Lys) of SEQ ID NO:8;
 - m) a polypeptide consisting of amino acid residues 69 (Glu) to 102 (Asp) of SEQ ID NO:8;

- n) a polypeptide consisting of amino acid residues 81 (Cys) to 96 (Lys) of SEQ ID NO:8;
- o) a polypeptide consisting of amino acid residues 81 (Cys) to 102 (Asp) of SEQ ID NO:8; and
- p) a polypeptide consisting of amino acid residues 96 (Lys) to 102 (Asp) of SEQ ID NO:8,

wherein the polypeptide elicits an immune response in the animal to produce the antibody; and isolating the antibody from the animal; and wherein the antibody specifically binds to an IL-20 polypeptide (SEQ ID NO:8).

- 2. The method according to claim 1, wherein the antibody reduces the pro-inflammatory activity of IL-20 (SEQ ID NO:8).
- 3. The method of claim 1, wherein the antibody produced by the method neutralizes the interaction of IL-20 (SEQ ID NO:8) with IL-22RA (SEQ ID NO:2).
- 4. The method of claim 3, wherein the neutralization by the antibody is measured by showing neutralization of IL-20 (SEQ ID NO:8) in an *in vitro* a cell-based neutralization assay.
- 5. The method of claim 1, wherein the antibody reduces the pro-inflammatory activity of both IL-20 (SEQ ID NO:8) and IL-22 (SEQ ID NO:6).
- 6. An antibody produced by the method of claim 1, which binds to a polypeptide of SEQ ID NO:8.
- 7. The antibody of claim 2, wherein the antibody is (a) a polyclonal antibody, (b) a murine monoclonal antibody, (c) a humanized antibody derived from (b), (d) an antibody fragment, or (e) a human monoclonal antibody.

8. The antibody of claim 2, wherein the antibody further comprises a radionuclide, enzyme, substrate, cofactor, fluorescent marker, chemiluminescent marker, peptide tag, magnetic particle, or toxin.
9. The antibody of claim 7, wherein the antibody further comprises PEGylation.
10. An antibody or antibody fragment that binds to a polypeptide comprising a sequence of amino acid residues as shown in SEQ ID NO:8; and reduces the pro-inflammatory activity of IL-20 (SEQ ID NO:8).
11. The antibody or antibody fragment according to claim 11, wherein the antibody or antibody fragment reduces the pro-inflammatory activity of either IL-20 (SEQ ID NO:8) or IL-22 (SEQ ID NO:6).
12. The antibody or antibody fragment according to claim 10, wherein the or antibody fragment is (a) a polyclonal antibody, (b) a murine monoclonal antibody, (c) a humanized antibody derived from (b), (d) an antibody fragment, or (e) a human monoclonal antibody.
13. The antibody or antibody fragment according to claim 10, wherein the antibody further comprises a radionuclide, enzyme, substrate, cofactor, fluorescent marker, chemiluminescent marker, peptide tag, magnetic particle, drug, or toxin.
14. The antibody of claim 10, wherein the antibody further comprises PEGylation.
15. A method for reducing or inhibiting IL-20-induced proliferation or differentiation of hematopoietic cells and hematopoietic cell progenitors comprising culturing bone marrow or peripheral blood cells with a composition comprising an amount of an antibody according to claim 3 sufficient to reduce proliferation or differentiation of the hematopoietic cells in the bone marrow or peripheral blood cells as compared to bone marrow or peripheral blood cells cultured in the absence of the antibody.

16. The method of claim 15, wherein the hematopoietic cells and hematopoietic progenitor cells are lymphoid cells.
17. The method of claim 16, wherein the lymphoid cells are macrophages or T cells.
18. A method of reducing IL-20-induced inflammation comprising administering to a mammal with inflammation an amount of a composition of an antibody according to claim 3 sufficient to reduce inflammation.
19. A method of reducing IL-20-induced inflammation comprising administering to a mammal with inflammation an amount of a composition of an antibody or antibody fragment according to claim 10 sufficient to reduce inflammation.
20. A method of suppressing an inflammatory response in a mammal with inflammation comprising:
 - (1) determining a level of serum amyloid A protein;
 - (2) administering a composition comprising an antibody according to claim 3 in an acceptable pharmaceutical vehicle;
 - (3) determining a post administration level of serum amyloid A protein;
 - (4) comparing the level of serum amyloid A protein in step (1) to the level of serum amyloid A protein in step (3),wherein a lack of increase or a decrease in serum amyloid A protein level is indicative of suppressing an inflammatory response
21. A method of suppressing an inflammatory response in a mammal with inflammation comprising:
 - (1) determining a level of serum amyloid A protein;
 - (2) administering a composition comprising an antibody according to claim 5 in an acceptable pharmaceutical vehicle;
 - (3) determining a post administration level of serum amyloid A protein;

- (4) comparing the level of serum amyloid A protein in step (1) to the level of serum amyloid A protein in step (3),
wherein a lack of increase or a decrease in serum amyloid A protein level is indicative of suppressing an inflammatory response.
22. A method of suppressing an inflammatory response in a mammal with inflammation comprising:
- (1) determining a level of serum amyloid A protein;
 - (2) administering a composition comprising an antibody according to claim 16 in an acceptable pharmaceutical vehicle;
 - (3) determining a post administration level of serum amyloid A protein;
 - (4) comparing the level of serum amyloid A protein in step (1) to the level of serum amyloid A protein in step (3),
- wherein a lack of increase or a decrease in serum amyloid A protein level is indicative of suppressing an inflammatory response.
23. A method of treating a mammal afflicted with an inflammatory disease in which IL-20 plays a role, comprising:
- administering an antagonist IL-20 to the mammal such that the inflammation is reduced, wherein the antagonist comprising an antibody, antibody fragment, or binding polypeptide that specifically binds a polypeptide or polypeptide fragment of IL-22RA (SEQ ID NO:3) or is a polypeptide or polypeptide fragment of IL-22RA (SEQ ID NO:3); and wherein the inflammatory activity of IL-20 (SEQ ID NO:8) is reduced.
24. A method of claim 23, wherein the disease is a chronic inflammatory disease.
25. A method of claim 24, wherein the disease is a chronic inflammatory disease comprising inflammatory bowel disease, ulcerative colitis, Crohn's disease, arthritis, atopic dermatitis, or psoriasis

26. A method of claim 23, wherein the disease is an acute inflammatory disease.
27. A method of claim 26, wherein the disease is an acute inflammatory disease comprising endotoxemia, septicemia, toxic shock syndrome or infectious disease
28. A method of claim 23, wherein the antibody further comprises a radionuclide, enzyme, substrate, cofactor, fluorescent marker, chemiluminescent marker, peptide tag, magnetic particle, drug, or toxin.
29. An antibody comprising a monoclonal antibody that binds to an antigenic epitope of human IL-20 (SEQ ID NO:8) selected from the group consisting of:
 - a) a polypeptide consisting of amino acid residues 42 (Ile) to 102 (Asp) of SEQ ID NO:8;
 - b) a polypeptide consisting of amino acid residues 42 (Ile) to 60 (Ile) of SEQ ID NO:8;
 - c) a polypeptide consisting of amino acid residues 42 (Ile) to 69 (Glu) of SEQ ID NO:8;
 - d) a polypeptide consisting of amino acid residues 42 (Ile) to 81 (Cys) of SEQ ID NO:8;
 - e) a polypeptide consisting of amino acid residues 42 (Ile) to 96 (Lys) of SEQ ID NO:8;
 - f) a polypeptide consisting of amino acid residues 42 (Ile) to 102 (Asp) of SEQ ID NO:8;
 - g) a polypeptide consisting of amino acid residues 60 (Ile) to 69 (Glu) of SEQ ID NO:8;
 - h) a polypeptide consisting of amino acid residues 60 (Ile) to 81 (Cys) of SEQ ID NO:8;
 - i) a polypeptide consisting of amino acid residues 60 (Ile) to 96 (Lys) of SEQ ID NO:8;
 - j) a polypeptide consisting of amino acid residues 60 (Ile) to 102 (Asp) of SEQ ID NO:8;

- k) a polypeptide consisting of amino acid residues 69 (Glu) to 81 (Cys) of SEQ ID NO:8;
 - l) a polypeptide consisting of amino acid residues 69 (Glu) to 96 (Lys) of SEQ ID NO:8;
 - m) a polypeptide consisting of amino acid residues 69 (Glu) to 102 (Asp) of SEQ ID NO:8;
 - n) a polypeptide consisting of amino acid residues 81 (Cys) to 96 (Lys) of SEQ ID NO:8;
 - o) a polypeptide consisting of amino acid residues 81 (Cys) to 102 (Asp) of SEQ ID NO:8; and
 - p) a polypeptide consisting of amino acid residues 96 (Lys) to 102 (Asp) of SEQ ID NO:8,
- wherein the antibody reduces or neutralizes the activity of human IL-20 (SEQ ID NO:8).
- 30. The method of claim 29, wherein the antibody reduces or neutralizes the activity of human IL-20 (SEQ ID NO:8).
 - 31. The antibody of claim 29, wherein the antibody is selected from the group consisting of: (a) a murine monoclonal antibody, (b) a humanized antibody derived from (a), (c) an antibody fragment, and (d) a human monoclonal antibody.
 - 32. The antibody of claim 30, wherein the antibody further comprises PEGylation.
 - 33. The antibody of claim 30, wherein the antibody is selected from the group consisting of: (a) a murine monoclonal antibody, (b) a humanized antibody derived from (a), (c) an antibody fragment, and (d) a human monoclonal antibody.
 - 34. The antibody of claim 33, wherein the antibody further comprises PEGylation.

35. A method of treating a pathological condition in a subject associated with IL-20 activity comprising administering an effective amount of the antibody of claim 29, thereby treating said pathological condition.
36. The method of claim 35, wherein said pathological condition is a chronic inflammatory condition.
37. The method of claim 36, wherein said chronic inflammatory condition comprising inflammatory bowel disease, ulcerative colitis, Crohn's disease, arthritis, atopic dermatitis, or psoriasis.
38. The method of claim 36, wherein said pathological condition is an acute inflammatory condition.
39. The method of claim 38, wherein said acute inflammatory condition comprises endotoxemia, septicemia, toxic shock syndrome, or infectious disease.